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that it was a casual visitor who detected it, so that to this visitor, and not to the Lick staff, belongs the discovery. What such an outsider's discovery betokens about the efficiency of the staff it is not our purpose to remark. The value of our observations consisted in their great numbers, in the fact that depressions were seen for the first time, in the systematic search made for them all around the planet and in the information they have yielded in regard to its meteorology and topography. Of Prof. Campbell's attempt to criticise the discussion of these observations it is useless to speak, as, owing to his ignorance of the original data, his guesses on the subject are not important.

7. The Lick article asserts that the vegetation theory was suggested by Schiaparelli. If the writer will read, once more, our translation of Schiaparelli he will see that such is not the case, and that not only is Schiaparelli speaking solely of the canals, but that he rejects the mere suggestion of vegetation, nor does he hold it to-day. Nor is this all, for Prof. W. H. Pickering suggested the same theory many years before.

8. The attempt to disparage Mr. Lowell's discovery that the Martian longitudes came to the meridian twenty minutes behind time, by attributing it to Prof. Keeler, will be seen to be an error, by any one who cares to consult the original papers of both.

9. As to any knowledge at the Lick Observatory of a Martian atmosphere, it has been purely negative, Prof. Holden going so far in an article, in the *North American Review* for 1895, entitled 'Mistakes about Mars' as to declare that the opposition of 1894 would be memorable for having proved an absence of atmosphere. We may let Holden's Mistakes about Mars speak for themselves.

We could go on in this manner, but we have shown enough. We should not have noticed an article like the one before us had it not been an attempt on the rights of property, rights at least as sacred in intellectual matters as in those more material ones which the laws protect.

A. E. DOUGLASS,
For the Observatory.

LOWELL OBSERVATORY, FLAGSTAFF, ARIZONA,
August 14, 1896.

COMMERCIAL MICA IN NORTH CAROLINA: THE STORY OF ITS DISCOVERY.

IN an interesting and instructive article on Mica and Mica Mining, published in the *Popular Science Monthly*, for September, 1892 (Vol. XLI., p. 652), C. Hanford Henderson makes the following statement concerning the discovery of commercial mica in North Carolina:

"The location of the mines has been largely accidental. So far as I have been able to learn, the first one opened was the Sinkhole Mine in Mitchell county. The spot was marked by the existence of trenches, many hundred feet long in the aggregate, and in places fully twenty feet deep. Large trees growing on the *débris* indicated that the workings were very ancient. It was supposed that they had been for silver; and when the trenches were re-opened, at the close of the war, the search was for that metal and not for mica. Silver seems to dominate in the Carolinian dream of mineral wealth, when it is, of all such dreams, the one least likely to be realized. The search for silver being unsuccessful, the mines were again abandoned. The mica that had been thrown out was left on the dump, and soon advertised the real character of the mine. A stock driver, passing that way, carried a block of it to Knoxville, where it attracted the attention of men acquainted with its value. They investigated the matter, emigrated at once to Mitchell county and began systematic mining for mica. As the mineral was then selling for from eight to eleven dollars a pound, the rewards were considerable, and much enterprise was shown in the development of the industry."

This statement was also published in the *Engineering and Mining Journal*, for January 7, 1893 (Vol. LV., p. 4), as a part of an abstract of the above paper.

During the summer of 1880, as the assistant of the late Prof. W. C. Kerr, State Geologist of North Carolina, and in the capacity of a special agent of the Tenth Census, I visited the various mica localities of the State, for the purpose of securing statistics and such other information as was deemed necessary in making up his report. While in Bakersville I made careful inquiry concerning the origin of the

mica industry, and by reference to my notes taken at the time, and the accompanying letter of ex-United States Senator Thos. L. Clingman, received in August of that year, I am in a position to throw more light upon the subject.

The story then current in Bakersville was quite similar to that above given. On July 27th I had a conversation with Mr. C. T. C. Deake ('Old Roan'), editor and proprietor of the 'Roan Mountain Republican,' a very intelligent and well-informed citizen, who said in substance: Gen. Clingman while prospecting for *silver* at the Sinkhole Mine threw out mica.* A wagoner took some to Knoxville, Tenn. Here Messrs. Heap and Clapp were engaged in the hardware business. They knew the value of mica in New York. Clapp came first and leased the Sinkhole and other mines. This was about '70.

A few days later Mr. T. G. Heap, the surviving member of the firm, informed me that his attention was called to the existence of mica at the Sinkhole *silver* mine by a peddler of county rights in a broadcast wheat-sowing machine. This individual, 'footing it' through the country, came to the Sinkhole Mine, and seeing the bright, shining mica brought a sample to Knoxville, where he exhibited it on the street. No one recognizing its value save himself, he immediately dispatched his partner, Clapp, to lease the mine, which had been forfeited by the previous lessee (see Gen. Clingman's letter), and the first work was done 'on the day of the great eclipse, 1869.'

That "silver seems to dominate in the Carolinian dream of mineral wealth" was amply demonstrated during my trip through the Blue Ridge country sixteen years ago. As Henderson states, it was supposed that the prehistoric trenches of Mitchell and other counties were abandoned *silver* mines. That they were not has been conclusively shown by both Prof. Kerr and Gen. Clingman. The latter in his letter states positively that his object in opening the prehistoric mine at William Silvers,

known as 'Sinkhole,' was for the purpose of obtaining *mica*.

The association of silver with the excavations of this particular locality may have been due to the fact that they occurred on the property of a Mr. Silvers, and that they should eventually become known as old *Spanish silver* mines is not, at least, impossible, considering the widespread tradition that the early Spanish explorers reached western Carolina.

Gen. Clingman's letter is as follows:

ASHEVILLE, August 18, 1880.

DEAR SIR: Your favor has been received, and I will, with pleasure, make you a brief statement with reference to the mica operations in our own State.

During the summer of 1867, when in New York, I learned that mica, owing to the failure of supplies from New England, had become very scarce in the market. Prof. A. Trippell told me that he had for certain parties paid \$8 per pound for ordinary mica.

Knowing that it existed in several localities in North Carolina, of good quality, I, on my return, made examinations in several of the counties. I commenced with Cleveland, on the east, and passed through Rutherford, Burke, and McDonald east of the ridge. I then examined the northeastern part of Buncombe, south of the Black Mountains, and gave a good deal of time to Yancey and Mitchell. I caused work to be done in Cleveland, Burke, Yancey and Mitchell. I became satisfied that the latter county held out the best prospects for a good supply of the mineral.

I therefore returned to New York, and made an arrangement with Messrs. Sloane and Menden, then doing business at 113 Liberty street. They agreed to work all such mines as I had secured or might secure, and pay me one-half of the net profits. Mr. Menden, in January, 1868, visited with me some localities east of the Ridge, and we had some mica taken out in Cleveland. Owing to the severity of the winter weather, he postponed his visit to Mitchell and Yancey until the opening of the spring. In May we went into Yancey and Mitchell to the Ray Mine and some others. Owing to the roughness of the roads, however, he declined to go with me to the Silvers and

*Based upon this and similar statements I, too, expressed the opinion that the search was for *silver*. See an article on 'Mica Mining in North Carolina,' published in the Mining Record, N. Y., July 2, 1881.

Buchanan Mines and decided to abandon the business. It may seem singular, but nevertheless it is the fact, that on my previous hasty examination I had selected what have since proved the three best mines, viz.: the Ray Mine in Yancey, and the Silvers, or Sinkhole, and the Buchanan Mines of Mitchell.

After Messrs. Sloane and Menden declined prosecuting the engagement, not being willing to abandon it entirely, in the summer of 1868, I caused some work to be done at the William Silvers, or Sinkhole Mine, as it has since been called. The shafts I had sunk and the tunnels driven showed an abundance of good mica. Being obliged to leave, I contracted with the foreman, who was managing the workmen employed, to save the blocks of mica, which were more than sufficient to pay the expenses of the operation. I learned, however, that soon afterwards he, having heard that some members of his family were sick, abandoned the work and left the mica lying on the ground. As I was then in very bad health, I did not feel able to superintend the work myself, and [as I] was not in condition to employ suitable agents, I decided to abandon the enterprise and surrendered my contract to Mr. Silvers and told him to make some new arrangement.

Mr. Heap, who has been the largest operator in the mica business, informed me that he had been induced to go into the business by this circumstance. A horse driver, on his return, knocked up one of the blocks of mica left on the ground and carried it to Knoxville in the autumn of 1868. On seeing it, Mr. Heap made inquiries as to the locality, obtained a lease from Mr. Silvers and commenced operations there. His success encouraged others to embark in the business, Mr. Garrett Ray being one of the first to begin in the early part of 1869, at a place where I had taken some specimens. The working gradually spread to other localities in these and other counties.

For additional and fuller information, I refer you to a publication of mine in the printed volume of my writings and speeches which you can find in the libraries at Chapel Hill. It begins on page 130, headed *Old Diggings for Mica, etc.* The name of Mr. Silvers is misprinted there. That publication will give you, prob-

ably, the additional matter you desire. It was originally published in the *Asheville Expositor* at the time of its date, April 8, 1873.

* * * * *

Hoping that this statement may be sufficient for your purpose, I am

Very truly yours, etc.

T. L. CLINGMAN.

Prof. F. W. Simonds.

From the above letter it will be seen that the location of the mines was not 'largely accidental;' on the contrary, that Clingman made the preliminary investigations for a purpose, which was to discover commercial mica, and that he succeeded. But, as has often happened, he failed to grasp the prize almost within his reach. Ill health and a want of capital caused him to abandon the enterprise, and strangers, profiting by his preliminary work, reaped a substantial reward.

FREDERIC W. SIMONDS.

SCHOOL OF GEOLOGY,
UNIVERSITY OF TEXAS, July, 1896.

SCIENTIFIC LITERATURE.

Manual of Lithology: Treatment of the Principles of the Science with Special Reference to Megascopic Analysis. By EDWARD H. WILLIAMS, JR., E. M., F. G. S. A., Professor of Mining Engineering and Geology, Lehigh University, South Bethlehem, Pa. With six plates. Second Edition. First Thousand. New York, John Wiley & Sons. 1895.

In reviewing this work particular attention ought to be paid to its objects and to the system of education that has given it birth. The criticisms may seem severe, but they are aimed only at educational methods that the reviewer considers radically wrong, even if circumstances force him to give seeming countenance to them.

The principal points here noted are two: (1), the neglect of considering the student in preparing a text-book, and (2) the habit of spreading instructors over too extended a field.

A text-book to be of practical use to students must be clear, concise and accurate in its statements. In an observational science it should indicate in the most unmistakable language the